-- In this example, working CMTS 39 provides downstream signals on a first downstream channel and working CMTS 41 provides downstream signals on a second, different, downstream channel. Preferably, protecting CMTS 37 provides service on the same downstream channel as the working CMTS for which it is taking over. Thus, in most embodiments, protecting CMTS 37 can service only one of working CMTS 39 and working CMTS 41 at any given time. In the depicted embodiment, 2-to-1 multiplexers 44 and 45 reside on the downstream intermediate frequency paths of working CMTS 39 and working CMTS 41, respectively. These multiplexers also receive signals from a downstream port of protecting CMTS 37 when it is acting on behalf of one of the working CMTSs. Note that downstream signals from protecting CMTS 37 pass through a splitter/combiner 47 that routes the signal to both multiplexer 44 or multiplexer 45, as appropriate. Downstream signals from multiplexers 44 and 45 are upconverted to radio frequency signals of appropriate frequency by upconverters 49 and 51, respectively. --

Please replace the paragraph beginning at page 15, line 12, with the following rewritten paragraph:

-- Another field of the packet header 301 is a 1 byte "src_id" 309 that provides a membership identifier of the sender. Valid numbers for working CMTSs are 1-255. 0 is reserved for protecting CMTS in a group. A 1 byte "dest_id" 311 provides a membership identifier of the receiver. Valid numbers for the working CMTSs are 1-255. 0 is reserved for protecting CMTS in a group. Next, header 301 includes a 2 byte "tran_id" field 313 that is used to track message order. A 2 byte "length" field 315 specifies the total length of a CCP message, excluding its header. A 2 byte "reserved" field 317 specifies a data field which is reserved. Authentication data 319 contain encryped authentication data (e.g., MD5 or SHA encrypted data) in a 16 byte field for example. In a specific embodiment, if the MSB of version field 303 is 0, authentication is disabled and these 16 bytes are not shown in message. --

IN THE CLAIMS:

All pending claims have been reproduced in an appendix below for the convenience of the Examiner. The appendix pages may be treated as substitute pages for the pages of claims in the present specification.

Please substitute the following clean claims 1, 7, 8, 12, 14, 18, 22, 24, 25, 29, 32, 34, 37, 39, 44, 46, 51, 54, and 58 for the corresponding claims. A marked up version of the amended claims and all pending claims are presented in the Appendix below.

1. (Amended) A method of providing backup service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and

having a protecting CMTS available to take over service to the group of cable modems, the method comprising:

receiving information about the status of the group of cable modems from the working CMTS to thereby synchronize the protecting CMTS to the working CMTS at least when configuration data associated with the working CMTS is changed, or a new protecting CMTS is discovered;

determining that the protecting CMTS is to take over service to the group of cable modems; and

~~taking over service to the group of cable modems.~~

7. (Amended) A method of providing backup service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the method comprising:

receiving information about the status of the group of cable modems from the working CMTS to thereby synchronize the protecting CMTS to the working CMTS;

determining that the protecting CMTS is to take over service to the group of cable modems; and

taking over service to the group of cable modems,

wherein receiving information about the status of the group of cable modems comprises receiving a portion of synchronization data for the group of cable modems, and wherein the portion of synchronization data comprises data that has changed since a previous synchronization.

8. (Amended) A method of providing backup service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the method comprising:

receiving information about the status of the group of cable modems from the working CMTS to thereby synchronize the protecting CMTS to the working CMTS;

determining that the protecting CMTS is to take over service to the group of cable modems; and

taking over service to the group of cable modems,

wherein the protecting CMTS provides downstream messages to the group of cable modems on the same downstream channel as used by the working CMTS to provide service to the group of cable modems.

12. (Amended)   A method of providing backup service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the method comprising:

receiving information about the status of the group of cable modems from the working CMTS to thereby synchronize the protecting CMTS to the working CMTS;

determining that the protecting CMTS is to take over service to the group of cable modems; and

taking over service to the group of cable modems,

wherein determining that the protecting CMTS is to take over service to the group of cable modems comprises determining that the working CMTS is not responding to the protecting CMTS or is not providing signals to a designated node on the cable network, and

wherein determining that the working CMTS is not responding comprises receiving no acknowledgement of a HELLO message within a predefined time after the HELLO message was sent from the protecting CMTS to the working CMTS.

14. (Amended)   A method of providing backup service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the method comprising:

receiving information about the status of the group of cable modems from the working CMTS to thereby synchronize the protecting CMTS to the working CMTS;

determining that the protecting CMTS is to take over service to the group of cable modems; and

taking over service to the group of cable modems,

wherein determining that the protecting CMTS is to take over service to the group of cable modems comprises receiving notification from a network node that a downstream signal from the working CMTS is no longer being received, and

wherein the network node is a cable modem or an upconverter.

18. (Amended)   CMTS apparatus capable of acting as a protecting CMTS on a cable network having a group of cable modems to be serviced by a working CMTS, such that when the working CMTS becomes unavailable, the protecting CMTS can take over service to the group of modems, the CMTS apparatus comprising:

one or more processors; and

a memory,

wherein at least one of the processors and the memory are configured or designed to receive and store synchronization data from the working CMTS at least when configuration data associated with the working CMTS is changed, or a new protecting CMTS is discovered, the synchronization data specifying information about the group of cable modems.

22. (Amended)   CMTS apparatus capable of acting as a protecting CMTS on a cable network having a group of cable modems to be serviced by a working CMTS, such that when the working CMTS becomes unavailable, the protecting CMTS can take over service to the group of modems, the CMTS apparatus comprising:

one or more processors; and

a memory,

wherein at least one of the processors and the memory are configured or designed to receive and store synchronization data from the working CMTS, the synchronization data specifying information about the group of cable modems, and

wherein at least one of the processors and the memory are configured or designed to periodically send HELLO messages to the working CMTS to confirm that the working CMTS is operating.

24. (Amended)   CMTS apparatus capable of acting as a protecting CMTS on a cable network having a group of cable modems to be serviced by a working CMTS, such that when the working CMTS becomes unavailable, the protecting CMTS can take over service to the group of modems, the CMTS apparatus comprising:

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one or more processors; and

a memory,

wherein at least one of the processors and the memory are configured or designed to receive and store synchronization data from the working CMTS, the synchronization data specifying information about the group of cable modems, and

wherein at least one of the processors and the memory are configured or designed to service the group of cable modems using a downstream frequency that is identical to a downstream frequency used by the working CMTS.

25. (Amended)   A computer program product comprising a machine readable medium on which is provided instructions for providing backup service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the instructions comprising:

receiving information about the status of the group of cable modems from the working CMTS to thereby synchronize the protecting CMTS to the working CMTS at least when configuration data associated with the working CMTS is changed, or a new protecting CMTS is discovered;

determining that the protecting CMTS is to take over service to the group of cable modems; and

taking over service to the group of cable modems.

29. (Amended)   A computer program product comprising a machine readable medium on which is provided instructions for providing backup service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the instructions comprising:

receiving information about the status of the group of cable modems from the working CMTS to thereby synchronize the protecting CMTS to the working CMTS;

determining that the protecting CMTS is to take over service to the group of cable modems; and

taking over service to the group of cable modems,

wherein the instructions provide that the protecting CMTS provides downstream messages to the group of cable modems on the same downstream channel as used by the working CMTS to provide service to the group of cable modems.

32. (Amended)　　　A computer program product comprising a machine readable medium on which is provided instructions for providing backup service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the instructions comprising:

receiving information about the status of the group of cable modems from the working CMTS to thereby synchronize the protecting CMTS to the working CMTS;

determining that the protecting CMTS is to take over service to the group of cable modems; and

taking over service to the group of cable modems,

wherein the instructions for determining that the protecting CMTS is to take over service to the group of cable modems comprises instructions for determining that the working CMTS is not responding to the protecting CMTS or is not providing signals to a network node on the cable network, and

wherein the network node is a cable modem or an upconverter.

34. (Amended)　　　CMTS apparatus capable of acting as a working CMTS on a cable network having a group of cable modems to be serviced by the working CMTS, such that when the working CMTS becomes unavailable, a protecting CMTS can take over service to the group of cable modems, the CMTS apparatus comprising:

one or more processors; and

a memory,

wherein at least one of the processors and the memory are configured or designed to send synchronization data to the protecting CMTS at least when configuration data associated with the working CMTS is changed, or a new protecting CMTS is discovered, the synchronization data specifying information about the group of cable modems.

37. (Amended)　　　CMTS apparatus capable of acting as a working CMTS on a cable network having a group of cable modems to be serviced by the working CMTS, such that when

the working CMTS becomes unavailable, a protecting CMTS can take over service to the group of cable modems, the CMTS apparatus comprising:

one or more processors; and

a memory,

wherein at least one of the processors and the memory are configured or designed to send synchronization data to the protecting CMTS, the synchronization data specifying information about the group of cable modems, and

wherein at least one of the processors and the memory are configured or designed to send HELLO acknowledge messages to the protecting CMTS upon receipt of a HELLO message from the protecting CMTS.

39. (Amended)   A method of providing working service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the method comprising:

sending synchronization data about the group of modems to the protecting CMTS at least when configuration data associated with the working CMTS is changed, or a new protecting CMTS is discovered;

determining that the protecting CMTS should take over service to the group of cable modems;

notifying the protecting CMTS that it should take over service to the group of cable modems; and

discontinuing service to the group of cable modems.

44. (Amended)   A method of providing working service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the method comprising:

sending synchronization data about the group of modems to the protecting CMTS;

determining that the protecting CMTS should take over service to the group of cable modems;

notifying the protecting CMTS that it should take over service to the group of cable modems;

discontinuing service to the group of cable modems; and

determining that a parameter pertaining to at least one of the cable modems in the group of cable modems has changed, and wherein sending the synchronization data comprises sending information pertaining to the changed parameter to the protecting CMTS in order to allow the protecting CMTS to provide service to the group of cable modems.

46. (Amended)   A method of providing working service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the method comprising:

sending synchronization data about the group of modems to the protecting CMTS;

determining that the protecting CMTS should take over service to the group of cable modems;

notifying the protecting CMTS that it should take over service to the group of cable modems; and

discontinuing service to the group of cable modems,

wherein determining that the protecting CMTS should take over service to the group of cable modems comprises receiving notification from a network node that a downstream signal from the working CMTS is no longer being received, and

wherein the network node is a cable modem or an upconverter.

51. (Amended)   A computer program product comprising a machine readable medium on which is provided instructions for providing working service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the instructions comprising:

sending synchronization data about the group of modems to the protecting CMTS at least when configuration data associated with the working CMTS is changed, or a new protecting CMTS is discovered;

determining that the protecting CMTS should take over service to the group of cable modems;

notifying the protecting CMTS that it should take over service to the group of cable modems; and

discontinuing service to the group of cable modems.

54. (Amended)   A computer program product comprising a machine readable medium on which is provided instructions for providing working service to a group of cable modems on a cable network having a working CMTS providing service to the group of cable modems and having a protecting CMTS available to take over service to the group of cable modems, the instructions comprising:

sending synchronization data about the group of modems to the protecting CMTS;

determining that the protecting CMTS should take over service to the group of cable modems;

notifying the protecting CMTS that it should take over service to the group of cable modems;

discontinuing service to the group of cable modems; and

instructions for determining that a parameter pertaining to at least one of the cable modems in the group of cable modems has changed, and wherein the instructions for sending the synchronization data comprises instructions for sending information pertaining to the changed parameter to the protecting CMTS in order to allow the protecting CMTS to provide service to the group of cable modems.

58. (Amended)   A method of providing backup service to a group of network nodes on a network having a working headend device providing service to the group of network nodes and having a protecting headend device available to take over service to the group of network nodes, the method comprising:

receiving information about the status of the group of network nodes from the working headend device to thereby synchronize the protecting headend device to the working headend device at least when configuration data associated with the working headend device is changed, or a new protecting headend device is discovered;

determining that the protecting headend device is to take over service to the group of network nodes; and

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